

Unit cohesion and mental health in the UK armed forces

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Background	Unit cohesion is recognized as a potentially modifiable factor in the aetiology of mental illness among military personnel.
Aims	To examine the association between unit cohesion and probable post-traumatic stress disorder (PTSD), common mental disorder and alcohol misuse, in UK armed forces personnel deployed to Iraq.
Methods	A sample of 4901 male UK armed forces personnel who had deployed to Iraq was drawn from a cohort of personnel who participated in a cross-sectional postal questionnaire study between June 2004 and March 2006. Information was collected on socio-demographic and military characteristics, deployment experiences and information on current health.
Results	Perceived interest from seniors was associated with less probable PTSD [odds ratio (OR) 0.42, 95% confidence interval (CI) 0.26–0.67] and common mental disorder (OR 0.68, 95% CI 0.53–0.87). Among regular personnel, feeling well informed was associated with less common mental disorder (OR 0.74, 95% CI 0.58–0.95) and comradeship was associated with greater alcohol misuse (OR 1.98, 95% CI 1.19–3.28). Feeling able to talk about personal problems was associated with less alcohol misuse among reserve personnel (OR 0.31, 95% CI 0.16–0.60). The general construct of unit cohesion was predictive of less probable PTSD (OR 0.69, 95% CI 0.58–0.81) and common mental disorder (OR 0.80, 95% CI 0.73–0.87).
Conclusions	Unit cohesion had a linear association with less probable PTSD and common mental disorder. Of the individual items, perception of leadership was associated with less probable PTSD and common mental disorder. Comradeship was associated with greater alcohol misuse among regular personnel, while feeling able to talk about personal problems was associated with less alcohol misuse for reserve personnel.
Key words	alcohol misuse; common mental disorder; leadership; military; post-traumatic stress disorder; unit cohesion.

Introduction

Unit cohesion describes the process that, to varying degrees, unites or keeps together members of any group [1]. Despite recognition of unit cohesion as an important phenomenon for organizational functioning, there is considerable divergence in how unit cohesion has been defined and measured [2,3]. The conceptualization of unit cohesion in the military literature varies from the use of individual items, to assess how cohesive or unified a unit is, to multidimensional

constructs that assess peer bonding, bonding with leaders, task support and emotional support [2,4,5].

The effect of cohesion on individual and group performance has been well researched in both civilian and military fields, and it has long been considered that cohesion within military units enhances performance and operational effectiveness [2]. Unit cohesion has also been recognized as a protective factor for troops in the aetiology of mental health problems [6]. Wessely [7] describes how the conventional wisdom of the last century has been

'that soldiers are supported by and support the small group in which they live and fight and that breakdown becomes more likely when they cease to be part of that group'.

Following the long-term commitment of the UK armed forces to conflicts such as those in Iraq and Afghanistan, increasing attention has been paid in recent years to the potential effects on the mental health of servicemen and women [8,9]. Unit cohesion has been recognized as a potentially modifiable factor in the aetiology of mental illness and has been found to be a protective factor of post-traumatic stress disorder (PTSD), common mental disorder and physical ill health in military personnel [3,6,8,10,11]. In contrast, little has been written about the impact of unit cohesion on alcohol misuse in military personnel [12]. Alcohol has long been used by military personnel as a bonding tool, as well as a coping device [13]. Browne *et al.* [12] have shown that high levels of comradeship and low levels of leadership were linked with heavy drinking.

The association between unit cohesion and mental health outcomes has also been shown to differ depending on how unit cohesion is measured. For instance, Rona *et al.* [9] found that there was a borderline non-significant association between a multidimensional measure of unit cohesion and PTSD; yet, high levels of comradeship had a significant association with lower levels of PTSD. Furthermore, there is some disparity in the literature as to the type of relationship, whether there is a linear or curvilinear association, between unit cohesion and PTSD.

We have previously reported on factors associated with PTSD and alcohol misuse, including cohesion and comradeship [8,12] and on pre-enlistment and military factors that are predictive of unit cohesion and morale [14]. In this paper, we examine the protective effect of unit cohesion, measured with separate items and as a general construct, on probable PTSD, common mental disorder and alcohol misuse. We also examine whether unit cohesion serves as a moderator between deployment exposures and the mental health outcomes. Finally, we examine whether there is a non-linear trend for the associations between the unit cohesion construct and the mental health outcomes.

Methods

This study utilized data from the first phase of a longitudinal cohort study of UK armed forces personnel undertaken by the King's Centre for Military Health Research (KCMHR) [15]. The data were collected with self-report questionnaires distributed through a postal survey and visits to military bases. The sample included 4722 personnel who had deployed on Operation TELIC 1 (TELIC is the UK codename for operations in Iraq and TELIC 1 denotes the initial phase of the Iraq war in 2003, defined as 18 January 2003 to 28 April 2003) and 5500 personnel who served in the military at this time but had not deployed to Iraq (the 'ERA' group). Of the ERA group, a number

were subsequently deployed on later TELIC deployment (TELIC 2–6). The cohort study had a response rate of 59%.

The analytical sample consists of 4901 male regular and reserve (personnel who have enlisted as volunteers) service personnel from the Royal Navy, Royal Marines, British Army and Royal Air Force who were deployed to Iraq on any TELIC operation and who had responded to at least two of the four questions about unit cohesion. Women were excluded due to small numbers.

Participants answered questions about military and deployment factors, lifestyle factors and health outcomes. Variables included socio-demographic and military factors [rank, service and enlistment status (regulars or reserves) and marital status], childhood adversity measured as a composite score of 16 adverse childhood events (including questions such as coming from a close family, playing truant from school or being hit by parents or caregivers regularly), [16] relationship with family while deployed (reporting major problems at home and having no perceived family support), being deployed to a forward area (zone of confrontation), perception of work carried out in theatre (theatre of deployment is the geographical area where armed conflict is conducted as part of military operations), in theatre experience, which was measured as a composite score of eight factors such as discharging weapon in direct combat, seeing personnel wounded or killed, experiencing landmine strikes, coming under mortar or artillery fire or experiencing hostility from civilians; thinking they might be killed and difficulties adjusting to being back home [8,12].

Unit cohesion was measured with four variables: 'I felt a sense of comradeship between myself and other people in my unit', 'I could have gone to most people in my unit if I had a personal problem', 'my seniors were interested in what I did or thought' and 'I felt well informed about what was going on'. The variables were measured on a five-point scale from strongly disagree to strongly agree. The responses were collapsed into a three-point scale (agree, neither and disagree) to avoid small cell counts for analyses of the mental health outcomes; this also fits with how these items have been used in previous work on this cohort [8,12].

For the purpose of generating the unit cohesion construct the 'neither' responses were recoded as missing. This decision was taken as a response of neither is a type of non-committal response and may reflect a valid absence of opinion or belief or an inaccurate reflection of the person's opinion [17]. Therefore, including a neither category may not result in a truly ordinal scale. Recoding of the central category as missing improved the scale reliability from a Cronbach's alpha of 0.74 to an alpha of 0.79. We also carried out analyses that included the neither category, which showed that excluding the central category had little impact on the general construct for unit cohesion (data not shown).

The unit cohesion construct was generated through principal component analysis (PCA) of a polychoric correlation matrix with pairwise deletion. The polychoric correlations were moderate to large (0.43–0.71). The PCA resulted in a one-factor solution and the general factor explained 67% of the total variance. All variables loaded on the general factor, with factor loadings ranging between 0.68 and 0.79. The factor loadings were standardized to a mean of 0 and a SD of 1.

PTSD was measured with the Post-traumatic Stress Disorder Checklist (PCL); cases were defined as those scoring ≥ 50 [18]. Common mental disorder was assessed with the 12 item General Health Questionnaire (GHQ-12), with cases defined as those scoring ≥ 4 [19]. Alcohol misuse was assessed with the Alcohol Use Disorders Identification Test (AUDIT) with cases defined as those scoring ≥ 16 [20].

All analyses were carried out in STATA 10 (Stata Corporation, College Station, TX, USA). Frequencies and percentages, or means and standard deviations for continuous variables, were calculated to describe the sample and the unit cohesion items. The associations between both the individual unit cohesion items and the unit cohesion construct and the mental health outcomes (probable PTSD, common mental disorder and alcohol misuse) were examined using logistic regression. Stratified analyses by enlistment status are reported for alcohol misuse but not for PTSD and common mental disorder due to small numbers of reserves and few differences in the associations with unit cohesion. The logistic regression analyses were adjusted for factors previously shown to be associated with the mental health outcomes and variables that may impact on unit cohesion, such as having major problems at home and feeling that one did not receive enough personal support from family during deployment (Table 1) [8,12]. Sample weights were adjusted for with the STATA survey commands (*svy*) or with the ‘*pweight*’ option. The moderating effect of unit cohesion was examined with an interaction effect for the general construct of unit cohesion and in theatre experiences. The associations between the unit cohesion construct and the three mental health outcomes were examined for non-linear trends with Box Tidwell regression analyses and graphically with lowess smoothing plots. The Box Tidwell analysis reports the difference in deviance between a continuous-power polynomial model for a predictor and a model with the linear predictor and indicates whether the relationship between the predictor and the outcome is linear.

Results

The majority of the sample was regular personnel who served in the Army (Table 1). Fifty-five per cent of the sample were educated to General Certificate of Secondary Education standard (examinations usually taken at age 16 years) or had no qualifications and 76% were in

a relationship. The level of unit cohesion, as measured with the individual items, was generally high. In particular, perception of comradeship was high, with 85% of the sample agreeing with this statement.

When adjusted for covariates, all individual unit cohesion variables were associated with a lower risk of probable PTSD (Table 2). However, after adjusting for all individual unit cohesion items, only perceived senior interest remained significant. There was no indication of a difference in the patterns of associations between the unit cohesion measures and PTSD for regular and reserve personnel (data available from the authors).

When adjusted for socio-demographic factors and deployment experiences, all individual unit cohesion variables were associated with a lower risk of common mental disorder (Table 2). Perceived senior interest and feeling well informed about what was going on remained significant after adjusting for all individual unit cohesion items. Stratified analyses by enlistment status showed that feeling well informed was associated with less common mental disorder among regular but not among reserve personnel [regulars odds ratio (OR) = 0.60, 95% CI 0.48–0.74; reserves OR = 0.76, 95% CI 0.48–1.20]. All other associations were similar between regular and reserve personnel.

Perceived senior interest and feeling well informed about what was going on were associated with lower levels of alcohol misuse for regular personnel (Table 3). After adjusting for all unit cohesion items, there was an association between higher perceived levels of comradeship and alcohol misuse. For reserve personnel, feeling able to approach most people in the unit with a personal problem was associated with lower levels of alcohol misuse (Table 3). The fully adjusted models were not fitted for reserve personnel due to small numbers.

The general construct of unit cohesion was predictive of lower levels of probable PTSD and common mental disorder after adjustment for socio-demographic factors and deployment experiences. However, there was no association between the general construct of unit cohesion and alcohol misuse after adjusting for covariates; childhood adversity explained the majority of this association. These results were comparable for regular and reserve personnel.

In order to examine whether unit cohesion served as a moderator between deployment exposures and the health outcomes, an interaction term was fitted between the general construct of unit cohesion and the in theatre experience variable in the logistic regression models. There was no support for a moderating effect of unit cohesion on any of the health outcomes (probable PTSD $F = 1.39$, $P = \text{NS}$; common mental disorder $F = 0.28$, $P = \text{NS}$; alcohol misuse $F = P = \text{NS}$).

The results from the Box Tidwell regression analyses showed that there was no indication of a non-linear association between the unit cohesion construct and the three

Table 1. Sample descriptives and unit cohesion variables ($n = 4901$), frequency (n) and weighted percentages (%), or weighted mean and standard deviation (SD)

Variable	N (%) or mean (SD) ^a
Serving status	
Regular	4194 (92)
Reserve	707 (8)
Service	
Navy	426 (9)
Marines	264 (6)
Army	3317 (67)
RAF	894 (19)
Age (years)	32.4 (7.5) ^a
Educational status ^b	
None	404 (9)
GCSEs	2090 (46)
A level	1393 (30)
Degree	745 (15)
Marital status	
Relationship	3733 (76)
Single	870 (18)
Ex-relationship	281 (6)
Childhood adversity	
0/1	1113 (23)
2/3	1587 (32)
4/5	996 (20)
≥ 6	1205 (25)
Rank	
Other ranks	999 (21)
Junior non-commissioned officer	1743 (35)
Senior non-commissioned officer	1330 (28)
Officer	790 (16)
Had major problems at home during deployment	1341 (27)
Did not receive enough personal support from family	158 (3)
Time spent in a forward area (zone of confrontation)	
No time	1925 (40)
Up to 1 month	1538 (32)
>1 month	1310 (28)
Work in theatre (area of deployment) was generally outside experience/ability	819 (17)
In theatre experience	
0/1	1890 (39)
2/3	1253 (25)
4/5	839 (17)
≥ 6	919 (19)
Thinking one might be killed	2855 (58)
Found it difficult to adjust to being back home	
Strongly disagree	1155 (26)
Disagree	1975 (42)
Agree	1242 (25)
Strongly agree	405 (8)
Felt a sense of comradeship with other people in the unit	
Disagree	303 (6)
Neither agree nor disagree	464 (10)
Agree	4128 (85)
Could have approached most people within the unit with personal problem	
Disagree	1380 (28)
Neither agree nor disagree	1025 (21)
Agree	2491 (51)

Table 1. (Continued)

Variable	N (%) or mean (SD) ^a
Seniors were interested in my actions and thoughts	
Disagree	1209 (24)
Neither agree nor disagree	862 (18)
Agree	2822 (58)
Felt well informed about what was going on	
Disagree	1339 (27)
Neither agree nor disagree	773 (16)
Agree	2787 (58)
General construct of unit cohesion	0.01 (1.0) ^a

Due to missing data, values do not add up to the total.

^aMean and standard deviation.

^bGeneral Certificate of Secondary Education (GCSEs) are examinations usually taken at age 16 years. A levels are usually taken at age 18 years and are required for entry to university.

health outcomes (probable PTSD non-linear deviation = 1.08, $P = \text{NS}$; common mental disorder non-linear deviation = 0.05, $P = \text{NS}$; alcohol misuse non-linear deviation = 1.06, $P = \text{NS}$).

Discussion

Unit cohesion was associated with lower levels of probable PTSD and common mental disorder in UK troops who were deployed to Iraq. Associations between the individual unit cohesion items and PTSD and common mental disorder were similar between regular and reserve personnel, but there were several differences between the groups in the patterns of associations with alcohol misuse. Perceived senior interest was associated with lower levels of probable PTSD and common mental disorder, highlighting the importance of caring leadership as a protective factor. Feeling well informed about what was going on was also a protective factor for common mental disorder among regular personnel.

There were also associations between the general construct of unit cohesion and lower levels of probable PTSD and common mental disorder but not with alcohol misuse. There was no indication of a moderating effect of unit cohesion on the association between in theatre experience and any of the three health outcomes. The results showed that the associations between unit cohesion and the three health outcomes were linear.

This study utilizes a large sample, taken from a cohort representative of the UK military, which had a good response rate (59%). Limitations of the present study include the exclusion of women due to small numbers, and further research is needed to assess the effect of unit cohesion upon mental health outcomes within this group. This study relied on self-report data to assess health outcomes, which represent probable outcomes

Table 2. Association between the unit cohesion items and probable PTSD and common mental disorder, ORs and 95% CIs

Measure	Probable PTSD OR (95% CI)			Common mental disorder OR (95% CI)		
	Unadjusted	Adjusted ^a	Adjusted ^b	Unadjusted	Adjusted ^a	Adjusted ^b
Felt a sense of comradeship with other people in the unit ^c						
Neither agree nor disagree	0.44 (0.25–0.78)**	0.53 (0.24–1.15)	0.63 (0.29–1.39)	0.51 (0.36–0.71)***	0.62 (0.41–0.92)*	0.69 (0.46–1.04)
Agree	0.34 (0.23–0.52)***	0.50 (0.29–0.86)*	0.92 (0.50–1.71)	0.43 (0.33–0.55)***	0.53 (0.39–0.73)***	0.71 (0.50–1.01)
Could have approached most people within the unit with personal problem ^c						
Neither agree nor disagree	0.50 (0.34–0.73)***	0.71 (0.45–1.13)	0.81 (0.49–1.33)	0.70 (0.57–0.86)***	0.86 (0.68–1.10)	1.02 (0.79–1.31)
Agree	0.39 (0.29–0.53)***	0.47 (0.32–0.69)***	0.67 (0.43–1.10)	0.60 (0.51–0.71)***	0.71 (0.58–0.87)**	0.94 (0.75–1.18)
Seniors were interested in my actions and thoughts ^c						
Neither agree nor disagree	0.53 (0.36–0.77)***	0.64 (0.40–1.01)	0.70 (0.43–1.15)	0.64 (0.52–0.79)***	0.75 (0.58–0.96)*	0.85 (0.65–1.11)
Agree	0.24 (0.18–0.34)***	0.34 (0.23–0.50)***	0.42 (0.26–0.67)***	0.42 (0.35–0.49)***	0.55 (0.45–0.67)***	0.68 (0.53–0.87)**
Felt well informed about what was going on ^c						
Neither agree nor disagree	0.69 (0.46–1.02)	0.83 (0.51–1.36)	1.03 (0.62–1.71)	0.72 (0.58–0.89)**	0.87 (0.67–1.12)	0.98 (0.75–1.28)
Agree	0.36 (0.26–0.49)***	0.55 (0.38–0.80)**	0.84 (0.56–1.27)	0.46 (0.39–0.55)***	0.62 (0.51–0.76)***	0.77 (0.62–0.97)*
General construct of unit cohesion	0.61 (0.53–0.70)***	0.69 (0.58–0.81)***		0.72 (0.66–0.77)***	0.80 (0.73–0.87)***	

^aAdjusted for serving status, service, age, rank, education, marital status, childhood adversity, major problems at home, family support, being in a forward area, work in theatre, in theatre experience, thinking one might be killed and found it difficult to adjust to being back home.

^bAdjusted for the variables in a and the other unit cohesion items listed in the table.

^cDisagree is the reference category.

Significance * $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$.

rather than actual diagnosis. However, all health outcomes were measured with well-validated questionnaires. The general unit cohesion construct has not been validated but it had good face validity and satisfactory reliability. Furthermore, as well as using this general construct, we have examined the effect of the individual unit cohesion items.

Previous research supports our findings of an association between the general construct of unit cohesion and probable PTSD and common mental disorder [3,11]. A number of studies have reported that unit cohesion, measured as a general construct, has a protective effect for the development of PTSD and other mental health problems [6,10,21]. On the other hand, we did not replicate other studies that found individual unit cohesion variables, measuring unit support or morale, were associated with less PTSD and psychological distress [11,22].

We have previously shown that alcohol misuse is associated with high levels of comradeship and low levels of perceived leadership [12]. In this study, the protective effect of perceived leadership did not reach significance after full adjustment in the analyses for regular personnel. However, since our point estimate was similar between the partially adjusted and the fully adjusted model, it is

likely that this was due to a lack of power. The association between comradeship and alcohol misuse among regular personnel contrast with a study of peace-keeping forces which found no association between levels of perceived morale during deployment and alcohol misuse [23]. Instead, Maguen *et al.* [23] showed that post-deployment alcohol misuse was best predicted by pre-deployment alcohol use and total stress symptom severity. There is little other literature regarding unit cohesion and alcohol misuse in the Armed Forces, but research on alcohol misuse in the police force supports an association with unit cohesion. Richmond *et al.* [24] argued that drinking alcohol aids the gathering of information and socialization among police colleagues, on a background of a hierarchical and male-dominated institution. Middleton Fillmore argues that in situations where colleagues are in a more close-knit team, occupational drinking subcultures are more likely to form [25]. The findings on alcohol misuse among reserve personnel differs from these studies as those who felt able to approach most people in the unit with a personal problem reported lower levels of alcohol misuse. It is possible that this is a reflection of alcohol misuse as a negative coping mechanism among reserve personnel and that those who feel able to talk with

Table 3. Association between the unit cohesion items and alcohol misuse stratified by regular and reserve personnel, ORs and 95% CI

Measure	Alcohol misuse OR (95% CI)				
	Regular personnel			Reserve personnel	
	Unadjusted	Adjusted ^a	Adjusted ^b	Unadjusted	Adjusted ^a
Felt a sense of comradeship with other people in the unit ^c					
Neither agree nor disagree	1.48 (0.95–2.33)	1.72 (0.98–3.01)	1.84 (1.05–3.22)*	0.77 (0.30–1.97)	0.75 (0.25–2.31)
Agree	1.43 (0.97–2.09)	1.61 (0.99–2.61)	1.98 (1.19–3.28)**	0.66 (0.34–1.30)	0.81 (0.35–1.86)
Could have approached most people within the unit with personal problem ^c					
Neither agree nor disagree	1.01 (0.81–1.26)	1.03 (0.78–1.36)	1.00 (0.75–1.33)	0.56 (0.30–1.04)	0.43 (0.20–0.91)*
Agree	0.92 (0.77–1.11)	0.84 (0.67–1.06)	0.87 (0.68–1.12)	0.40 (0.24–0.68)**	0.31 (0.16–0.60)***
Seniors were interested in my actions and thoughts ^c					
Neither agree nor disagree	0.83 (0.66–1.05)	0.92 (0.70–1.22)	0.91 (0.68–1.22)	0.66 (0.33–1.30)	0.72 (0.31–1.66)
Agree	0.59 (0.49–0.71)***	0.75 (0.60–0.94)*	0.78 (0.60–1.02)	0.64 (0.39–1.05)	0.91 (0.48–1.72)
Felt well informed about what was going on ^c					
Neither agree nor disagree	0.89 (0.70–1.12)	0.91 (0.68–1.21)	0.95 (0.71–1.28)	0.87 (0.46–1.65)	0.77 (0.34–1.73)
Agree	0.65 (0.54–0.78)***	0.78 (0.63–0.97)*	0.84 (0.66–1.08)	0.61 (0.37–1.02)	0.58 (0.31–1.09)
General construct of unit cohesion	0.92 (0.85–1.00)*	0.96 (0.87–1.06)		0.77 (0.63–0.95)*	0.80 (0.61–1.04)

^aAdjusted for serving status, service, age, rank, education, marital status, childhood adversity, major problems at home, family support, being in a forward area, work in theatre, in theatre experience, thinking one might be killed and found it difficult to adjust to being back home.

^bAdjusted for the variables in a and the other unit cohesion items listed in the table.

^cDisagree is the reference category.

Significance * $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$.

their peers about personal problems are able to engage in a more positive coping style.

Whether unit cohesion has a linear moderating effect or not on the association between exposures and mental health problems has been an area of contention. Work by Fontana *et al.* [26] on psychopathology among Vietnam veterans suggested that there was a non-linear moderating effect of unit cohesion on psychopathology. More recent work by Brailey *et al.* found support for a linear moderating effect of unit cohesion on life experiences in the aetiology of PTSD [3,26]. Similarly, a recent study of US air force personnel that examined the relationship between unit cohesion, stressors and PTSD found evidence of a linear moderating effect; although the authors suggest that the magnitude of warzone stress and short length of deployment may not have been sufficient to detect a curvilinear response [27]. In the present study, we found evidence of a linear relationship between unit cohesion and mental health outcomes, but there was no support for a moderating effect. We therefore did not further investigate a curvilinear moderating effect.

Unit cohesion is a potentially modifiable factor in the aetiology of various mental health outcomes. We

have shown that unit cohesion as a general construct has a significant association with lower levels of probable PTSD and common mental disorder among both regular and reserve personnel. Perceived leadership in particular was shown to be an important factor as it was associated with less probable PTSD and common mental disorder, as well as an indication that leadership was associated with less alcohol misuse for regular personnel. Similar associations were found for regular and reserve personnel between individual unit cohesion items and PTSD and common mental disorder but not with alcohol misuse. In contrast to reserve personnel, where feeling able to approach most people in the unit with a personal problem was associated with lower levels of alcohol misuse, comradeship was associated with higher levels of alcohol misuse among regular personnel. It is thus important that the UK armed forces strive to foster features which contribute to the overall construct of unit cohesion, such as comradeship, leadership and morale, given that so many other factors which have a positive association with higher levels of mental health problems are un-modifiable (for example, family background and exposures on deployment).

Key points

- A general construct of unit cohesion was found to have a direct linear association with lower levels of probable post-traumatic stress disorder and common mental disorder.
- Perceptions of leadership appear to be a particularly important factor for regular personnel with associations with lower levels of probable post-traumatic stress disorder and common mental disorder independently of other unit cohesion items such as comradeship.
- Feeling able to approach most people in the unit with a personal problem was associated with lower levels of alcohol misuse for reserve personnel; this contrasted with regular personnel for whom comradeship was associated with higher levels of alcohol misuse.

Funding

UK Ministry of Defence (MoD contract number R&T/1/0078).

Conflicts of interest

S.W. is Honorary Civilian Consultant Advisor in Psychiatry to the British Army and a Trustee of Combat Stress, a UK charity that provides services and support for veterans with mental health problems. All the other authors declare that they have no conflict of interests.

References

- Dion KL. Group cohesion: from 'field of forces' to multidimensional construct. *Group Dynam* 2000;**4**:7–26.
- Ahronson A, Cameron JE. The nature and consequences of group cohesion in a military sample. *Mil Psychol* 2007;**19**:9–25.
- Oliver LW, Harman J, Hoover E, Hayes SM, Pandhi NA. A quantitative integration of the military cohesion literature. *Mil Psychol* 1999;**11**:57–83.
- Griffith J. Relating cohesion to stress, strain, disintegration and performance: an organising framework. *Mil Psychol* 2002;**11**:27–55.
- Bartone PT, Adler AB. Cohesion over time in a medical task force. *Mil Psychol* 1999;**11**:85–107.
- Brailey K, Vasterling JJ, Proctor SP, Constans JJ, Friedman MJ. PTSD symptoms, life events and unit cohesion in US soldiers: baseline findings from the neurocognition deployment health study. *J Trauma Stress* 2007;**20**:495–503.
- Wessely S. Twentieth century theories on combat motivation and breakdown. *J Contemp Hist* 2001;**41**:268–286.
- Iversen A, Fear NT, Ehlers A *et al.* Risk factors for post-traumatic stress disorder among UK Armed Forces personnel. *Psychol Med* 2008;**38**:511–522.
- Rona R, Hooper R, Jones M *et al.* The contribution of prior psychological symptoms and combat exposure to post Iraq deployment mental health in the UK military. *J Trauma Stress* 2009;**22**:11–19.
- Pietrzak RH, Johnson DC, Goldstein MB *et al.* Psychosocial buffers of traumatic stress, depressive symptoms and psychosocial difficulties in veterans of Operations Enduring Freedom and Iraqi Freedom: the role of resilience, unit support and post-deployment social support. *J Affect Disord* 2010;**120**:188–192.
- Manning F, Fullerton T. Health and well-being in highly cohesive units of the US army. *J Appl Soc Psychol* 1988;**18**:503–519.
- Browne TE, Iversen A, Hull L *et al.* How do experiences in Iraq affect alcohol use amongst male UK armed forces personnel? *Occup Environ Med* 2008;**65**:628–633.
- Jones E, Fear NT. Alcohol use and misuse within the military: a review. *Int Rev Psychiatry* 2011;**23**:166–172.
- Murphy D, Sharp D. Exploring pre-enlistment and military factors associated with the morale of members of the UK Armed Forces. *Mil Med* 2011;**176**:13–18.
- Hotopf M, Hull L, Fear N *et al.* The health of UK military personnel who deployed to the 2003 Iraq war: a cohort study. *Lancet* 2006;**367**:1731–1741.
- Iversen AC, Fear NT, Simonoff E *et al.* Influence of childhood adversity on health among male UK military personnel. *Br J Psychiatry* 2007;**191**:506–511.
- Kent R. *Data Construction and Data Analysis for Survey Research*. New York: Palgrave Publishers Ltd, 2001.
- Blanchard EB, Jones-Alexander J, Buckley TC, Forneris CA. Psychometric properties of the PTSD Checklist (PCL). *Behav Res Ther* 1996;**34**:669–673.
- Goldberg D, Williams P. *A Users' Guide to the General Health Questionnaire*. Windsor, UK: NFER-Nelson, 1988.
- Babor TF, Higgins-Biddle JC, Saunders JB, Monteiro MG. *AUDIT: The Alcohol Use Disorders Identification Test*. 2nd edn. Geneva, Switzerland: World Health Organization, 2001.
- McTeague LM, McNally RJ, Litz BT. Prewar, war-zone and postwar predictors of posttraumatic stress in female Vietnam Veteran Health Care providers. *Mil Psychol* 2004;**16**:99–114.
- Vogt DS, Samper RE, King DW, King LA, Martin JA. Deployment Stressors and posttraumatic stress symptomatology: comparing active duty and National Guard/Reserve personnel from Gulf War I. *J Trauma Stress* 2008;**21**:66–74.
- Maugen S, Litz BT, Wang JL, Cook M. The stressors and demands of peacekeeping in Kosovo: predictors of mental health response. *Mil Med* 2004;**169**:198–206.
- Richmond RL, Kehoe L, Hailstone S *et al.* Quantitative and qualitative evaluations of brief interventions to change excessive drinking, smoking and stress in the police force. *Addiction* 1999;**94**:1509–1521.
- Middleton Fillmore K. Occupational drinking sub-cultures: an exploratory epidemiological study. In: Roman PM, ed. *Alcohol Problem Prevention Intervention in the Workplace. Employee Assistance Programs and Strategic Alternatives*. Westport, CT: Quorum Books, 1990; 77–94.
- Fontana A, Rosenheck R, Horvath T. Social support and psychopathology in the war zone. *J Nerv Ment Dis* 1997;**185**:675–680.
- Dickstein B, Mclean C, Mitz J *et al.* Unit cohesion and PTSD symptom severity in Air Force medical personnel. *Mil Med* 2010;**175**:482–486.